

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: § Serial No: unassigned
Daniel T. Colbert et al. § (division of application
§ Serial No. 10/000,746)

For: MACROSCOPICALLY MANIPULABLE §
NANOSCALE DEVICES MADE FROM § Filed: concurrently herewith
NANOTUBE ASSEMBLIES §
§ Group Art Unit: 2881 (anticipated)
§
Atty Dkt: 11321-P011CD10 § Prior Examiner: Jack I. Berman
§ 703.308.4849

U.S. Patent and Trademark Office
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**PRELIMINARY AMENDMENT ACCOMPANYING REQUEST FOR FILING
DIVISIONAL APPLICATION UNDER 37 C.F.R. § 1.53(b)**

Sir:

This paper accompanies a Request for Filing Divisional Application Under 37 C.F.R. § 1.53(b) and associated filing fee therefor ("the Request"). If the fee payment is missing or insufficient in amount, or if any other fees are determined to be due, the Assistant Commissioner, Commissioner, and/or the Director of the U.S. Patent & Trademark Office is/are hereby authorized to charge any such fees (or credit any overpayment) to Winstead Sechrest & Minick Deposit Account No. 23-2426, referencing matter number 11321-P011CD10.

AMENDMENTS

In the Title

Please amend the title by replacing the present title with the following:

-- METHOD FOR PRODUCING BORON NITRIDE COATINGS AND FIBERS AND COMPOSITIONS THEREOF--

In the Abstract

Please amend the abstract by replacing the present abstract with the following:

--This invention relates generally to forming boron nitride (BN) fibers comprising single-wall carbon nanotubes (SWNT) and compositions thereof. In one embodiment, an outer coating of BN is applied by supplying a BN precursor to a fiber of single-wall carbon nanotubes. The outer BN layer can provide enhanced insulating properties to the metallic carbon fiber. In another embodiment of this invention, an all BN fiber can be grown by starting with a SWNT template array topped with a suitable catalyst and fed BN precursors. These graphene and BN systems can be mixed because of the very close match of size to the two hexagonal units of structure. In addition, they exhibit enhanced properties due to the close match of coefficients of thermal expansion and tensile properties.--

In the Specification

Please amend the specification as noted on page 4, paragraph 11 of the Request by inserting before the first line of the specification the following:

--RELATED APPLICATIONS

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This application is a division of co-pending prior application Serial No. 10/000,746, filed on November 30, 2001, which is a continuation of prior application Serial No. 09/242,040 filed on September 13, 1999, which is the 35 U.S.C. § 371 national application of International Application Number PCT/US97/13896 filed on August 8, 1997, which designated the United States, claiming priority to provisional U.S. patent application Serial Number 60/023,732 filed on August 8, 1996. Each of the foregoing applications is commonly assigned to the assignee of the present invention and is hereby incorporated herein by reference in its entirety.

This application discloses subject matter related to the subject matter of U.S. patent application Serial Number 09/380,545, filed on September 3, 1999 in the name of Richard E. Smalley et al., entitled "Carbon Fibers Formed From Single-Wall Carbon Nanotubes," which application is commonly assigned to the assignee of the present invention and hereby incorporated herein by reference in its entirety.--

In the Claims

Please amend the claims as follows.

Please cancel claims 1-83 without prejudice or disclaimer to the subject matter thereof.

Please add the following new claims 84-93:

84. (new) A method for producing boron nitride coated fibers comprising:
 - a) supplying a boron nitride precursor to a fiber comprising a plurality of single-wall carbon nanotubes;
 - b) depositing a boron nitride coating on the fiber, wherein the boron nitride is formed from the boron nitride precursor; and
 - c) recovering the fibers coated with boron nitride.
85. (new) The method of claim 84 wherein the precursor comprises a chemical selected from the group consisting of tri-chloroborazine, diborane, NH₃, BCl₃ and combinations thereof.

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86. (new) A method for producing boron nitride fibers comprising:

- a) providing an array comprising single-wall carbon nanotubes;
- b) introducing a catalyst to the array, wherein the catalyst is suitable for growing boron nitride fibers;
- c) supplying a boron nitride precursor under growth conditions;
- d) growing boron nitride fibers onto the array; and
- e) recovering the boron nitride tubes.

87. (new) A method for producing alternating carbon-boron nitride fibers:

- a) providing an array comprising single-wall carbon nanotubes;
- b) introducing a catalyst to the array;
- c) introducing a carbon-containing feedstock gas to the array under conditions suitable for growing single-wall carbon nanotubes;
- d) removing the carbon-containing feedstock gas from the array;
- e) introducing a boron nitride precursor gas under growth conditions suitable for growing boron nitride fibers;
- f) removing the boron nitride precursor gas from the array; and
- g) recovering fibers comprising nanotubes having alternating carbon and boron nitride walls.

88. (new) Single-wall carbon nanotubes surrounded at least in part by an outer wall comprising a hexagonal boron nitride lattice wall structure.

89. (new) Single-wall nanotubes comprising a hexagonal boron nitride lattice wall structure.

90. (new) A single wall nanotube comprising:

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- a) a first plurality of segments, wherein each segment of the first plurality is a single-wall carbon nanotube segment; and
- b) a second plurality of segments, wherein each segment of the second plurality is a boron nitride nanotube segment.

91. (new) A single wall nanotube comprising:

- a) a first segment, wherein the segment is a single-wall carbon nanotube segment; and
- b) a second segment, wherein the segment is a boron nitride nanotube segment.

92. (new) A fiber comprising a plurality of single-wall nanotubes, wherein at least some of the plurality of single-wall nanotubes comprise:

- a) a first plurality of segments, wherein each segment of the first plurality is a single-wall carbon nanotube segment; and
- b) a second plurality of segments, wherein each segment of the second plurality is a boron nitride nanotube segment.

93. (new) A fiber comprising a plurality of single-wall nanotubes, wherein at least some of the plurality of single-wall nanotubes comprise:

- a) a first segment, wherein the segment is a single-wall carbon nanotube segment; and
- b) a second segment, wherein the segment is a boron nitride nanotube segment.

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REMARKS

1. *Status of the Application.* Claims 1-83 are cancelled herein without prejudice or disclaimer to the subject matter thereof. Claims 84-93 are added herein. No new matter is added by the addition of these claims.

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It is believed that each of the claims now pending in the present application recites elements neither taught nor suggested by the prior art. Further, it is believed that the application as a whole is in proper form and condition for allowance. If the Examiner believes that the application may be placed in even better condition for allowance, he or she is invited to contact the undersigned at the telephone number noted below. Alternatively, or in addition, if the Examiner believes that an Examiner interview would be beneficial, the Examiner is invited to note that the undersigned has ready access to the videoconferencing facilities of the South Central Intellectual Property Partnership at Rice University in Houston, Texas. The inventors and the undersigned would welcome the opportunity to use those facilities to clarify any issues deemed to remain unresolved.

Respectfully submitted,

Date: 21-DEC-2001

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